

Application No.: 10/828,701  
Appeal Brief Dated: July 25, 2006

MAT-8173US1



**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Appln. No: 10/828,701  
Applicants: Kazuro Okuzawa, et al.  
Filed: April 21, 2004  
Title: ELECTRO-ACOUSTIC TRANSDUCER AND  
METHOD OF MANUFACTURING THE SAME  
T.C./A.U.: 2615  
Examiner: Phylesha Larvinia Dabney  
Confirmation No.: 5384  
Docket No.: MAT-8173US1

**SUBSTITUTE APPEAL BRIEF**

***Mail Stop Appeal Brief - Patents***

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Further to the Notice of Appeal dated December 27, 2005, and the Notice of Non-Compliant Appeal Brief dated June 5, 2006, Appellant is submitting this Substitute Appeal Brief for the above-identified application.

**I. REAL PARTY IN INTEREST**

The Real Party In Interest in this matter is Matsushita Electric Industrial Co., Ltd.

**II. RELATED APPEALS AND INTERFERENCES**

There are no appeals or interferences known to Appellant, Appellant's legal representative, or Appellant's Assignee that will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

### **III. STATUS OF CLAIMS**

Claims 1-3 and 8-10 are pending in the application. Claims 1-3 and 8-10 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Sone, U.S. Patent 5,432,758, in view of the LOCTITE® World Design Handbook 2nd Edition. The rejection of all the pending claims, claims 1-3 and 8-10, has been appealed.

### **IV. STATUS OF AMENDMENTS**

There are no pending, unentered amendments after a Final Rejection.

### **V. SUMMARY OF CLAIMED SUBJECT MATTER**

The invention relates to a method of manufacture for electro-acoustic transducers, which are used in devices such as cellular phones. Specification, Title and page 1, lines 10-12. An electro-acoustic transducer comprises a frame **2**, a magnet **5** bonded to the frame **2** by an adhesive **6**, and a diaphragm **7** of magnetic material mounted above the magnet. Figure 3 and specification, page 1, lines 15-27. Sound is generated by diaphragm **7** when an electric current is applied to coil **3** from an external power supply (not shown). Specification, page 1, lines 28-30.

Epoxy resins, which must be cured in an oven for an hour or more, have been used as the adhesive **6**. *Id.*, page 2, lines 1-7. However, this relatively long curing time is a bottleneck in the production of electro-acoustic transducers. Specification, page 2, lines 6-7.

In appellant's invention, the adhesive is an adhesive that is curable by either ultraviolet (UV) radiation or heat. Specification, page 2, lines 25-26, page 3, lines 1-8, and claim 1. Alternatively, a heat curable adhesive or a self curing adhesive is used with an ultraviolet curable adhesive. Specification, page 9, line 29, to page 10, line 26, and claim 8. The adhesive is first irradiated with UV light from above the magnet to cure a portion of the adhesive layer and then heated. Specification, page 3, lines 16-20. By the method of the invention spattering of the adhesive during cure, well as during subsequent processing steps, such as solder reflow when the device is mounted on a printed circuit board, is suppressed; in addition, the curing time of the adhesive

is reduced leading to improved productivity. Abstract, and Experiment 2, page 7, line 17, to page 9, line 9, especially Table 2, page 8.

#### **VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL**

The only rejection of record, the rejection of claims 1-3 and 8-10, all the claims pending in the application, under 35 U.S.C. § 103(a) as unpatentable over Sone, U.S. Patent 5,432,758 ("Sone"), in view of LOCTITE® World Design Handbook 2nd Edition ("Loctite"), is to be reviewed on appeal.

#### **VII. ARGUMENT**

##### **A. LEGAL STANDARD**

Obviousness is analyzed using the four step analysis promulgated in *Graham v. John Deere*. *Graham v. John Deere*, 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966).

However, a *prima facie* case of obviousness can be rebutted if the applicant can establish (1) the existence of unexpected properties, or (2) that the art in any material respect taught away from the claimed invention. *In re Geisler*, 43 USPQ 1362, 1365 (Fed. Cir. 1997) (citing *In re Malagari*, 182 USPQ 549, 553 (CCPA 1974)). A reference that teaches away from a claimed invention cannot be combined with other references make it obvious. *Winner Int'l Royalty Corp. v. Wang*, 53 USPQ2d 1580, 1582 (Fed. Cir. 2000); *Tec Air, Inc. v. Denso Mfg. Michigan Inc.*, 52 USPQ2d 1294, 1298 (Fed. Cir. 1999); *In re Grasselli*, 218 USPQ 769, (Fed. Cir. 1983); see also *United States v. Adams*, 383 U.S. 39, 148 USPQ 479, 484 (1966) ([k]nown disadvantages in old devices which would naturally discourage search for new inventions may be taken into account in determining obviousness).

##### **B. REJECTION UNDER 35 U.S.C. § 103(a)**

Claims 1-3 and 8-10, all the claims pending in the application, stand rejected under 35 U.S.C. § 103(a) as unpatentable over Sone, U.S. Patent 5,432,758 ("Sone"), the primary reference, in view of LOCTITE® World Design Handbook 2nd Edition ("Loctite").

This rejection should be reversed for the following reasons.

*a. Loctite teaches away from the invention*

Section 2.2.4 of Loctite expressly recommends "Adhesives cured with activator systems (modified acrylics)," with or without additional UV light, for "magnet bonding." Loctite, Section 2.2.4, Table on the second page. These adhesive, in which an activator is applied to the bonding surface to cure the adhesive, are different than adhesives cured by heat and UV irradiation. Unlike the "heat + UV-curing" adhesives, the modified acrylics cure at room temperature.

Section 2.2.6, entitled "Adhesives cured by heat," recommends "pure heat curing" adhesives for "Chipbonding (electronics)." Loctite, Section 2.2.6, Table on the second page. In contrast, adhesives cured by "heat + UV-curing" are recommended for "Relay sealing." *Id.*

The person of ordinary skill in the art, having the advantage of the teachings of Loctite and wishing to bond a magnet to a frame, would use a "modified acrylic adhesive" or a "pure heat curing adhesive" instead of a "heat + UV-curing" adhesive to bond the magnet to the frame.

The Examiner has not made the *prima facie* case. A reference that teaches away from an invention cannot be combined with other references make it obvious. When the entire disclosure of Loctite is considered, Loctite teaches away from the claimed invention and cannot be combined with Sone. For this reason the rejection of claims 1-3 and 8-10 as unpatentable over Sone in view of Loctite should be withdrawn.

*b. Combination of the references at best makes heat + UV curing adhesives obvious to try*

According to the Examiner, Sone discloses "a manufactured electro-acoustic transducer comprising the steps of: providing a frame (4); forming an adhesive layer on the frame col. 5 lines 37-39; forming a frame-magnet laminate by disposing a magnet (26, col. 5, lines 37-39) on the frame with the adhesive layer in between; and

disposing a diaphragm (30) above said magnet." Office action of 10/19/05, page 2, lines 16-20.

The Examiner admits that Sone does not disclose the adhesive material used to attach the electrical components. *Id.*, lines 20-21.

According to the Examiner, Loctite Section 2.2.2 and Section 2.2.6 disclose "using a heat and UV curing adhesive to bond/attach via applying the adhesive to the surfaces, using UV light to cure the components (sic), and applying a secondary curing system, such as heat, for curing areas of the UV adhesive where the UV missed." *Id.*, lines 21-25. The Examiner's position is that it would be obvious to combine Sone with Loctite to produce appellant's invention because heat and UV curing adhesives provide quick setting and insure complete cure. *Id.*, page 1, line 26, to page 2, line 2.

However, the person of ordinary skill in the art reading the disclosure of Loctite would not be reasonably certain that a heat + UV curing adhesive would work in the desired application, bonding a magnet to a frame. Unlike many other electronic components, which are silicon chips, the magnet is made of steel, which is more dense than silicon so that a magnet would be heavier and, thus, more difficult to bond than a silicon chip. Steel also has different surface properties than silicon, which will affect bonding. Further, as discussed above, Loctite recommends other adhesives for "magnet bonding." Consequently, the disclosure of Loctite at best makes heat + UV curing adhesives "obvious to try." Obvious to try is not to be equated with obviousness under 35 U.S.C. § 103." *Gillette Co. v. S.C. Johnson & Son, Inc.*, 16 USPQ2d 1923, 1928 (Fed.Cir. 1990) (*citing cases*).

The Examiner has not made the *prima facie* case. For this additional reason, the rejection the rejection of claims 1-3 and 8-10 as unpatentable over Sone in view of Loctite should be withdrawn.

*c. Combination of the references does not produce appellant's invention*

Loctite teaches applying a secondary curing system, such as heat, for curing areas of the adhesive where the UV missed. Loctite, however, neither discloses nor

suggests that the crept out portion of the adhesive layer is first UV irradiated from above the magnet and then heat cured.

The Examiner also admits that the combination of references does not teach a portion of the adhesive layer as being exposed outside of the magnet. Office action of 10/19/05, page 3, lines 2-3. However, the Examiner asserts that it is well known in the art of attaching electrical components to frames to allow a portion of the adhesive to be exposed outside the components for increasing the adhesion area and thus increasing bond strength. *Id.*, lines 3-6.

This assertion is respectfully traversed. There is nothing in the record to support it. *See, In re Lee*, 61 USPQ 1430, 1432-34 (Fed. Cir. 2002) (agency findings must be supported by the record).

Appellant's invention, as recited by claim 1, also includes the feature of irradiating UV light from above the magnet. The advantage of this feature as disclosed on page 9, lines 1-13, is to seal the gaps, cracks, and voids from which the adhesive seeps out (see Figures 1 and 2). By irradiating UV light from above the magnet, the areas where the adhesive seeps out is sealed and the upward channels of evaporating/scattering adhesive are blocked during the heat-curing process. This prevents adhesive from sticking to the surface of the diaphragm during solder reflow, which adversely affects the properties of the device. *See*, Experiment 2, especially Table 2, page 8, which shows a 10-15 db decrease in sound pressure due to scattered adhesive. Thus, the purpose of irradiating UV light from above the magnet is not to increase the adhesive area. The main purpose of the UV curing is to avoid the evaporation/scattering of the crept out portion of the adhesives and is completely different than what is asserted in the Office Action.

The Examiner has not made the *prima facie* case. Even if combined, Sone and Loctite do not produce appellant's invention. For this additional reason, the rejection the rejection of claims 1-3 and 8-10 as unpatentable over Sone in view of Loctite should be withdrawn.

*d. Response to Examiner's "Response to Arguments"*

The Examiner has made the following response:

With respect to the applicant's argument pertaining the references not supporting the adhesive layer being UV irradiated from above the magnet before heat curing. The Examiner disagrees. The Loctite World Wide Design Handbook (paragraph 186) teaches that the UV irradiation occurs prior to heat curing to prevent "slumping.

Furthermore, the Loctite reference (paragraph 193) teaches the UV irradiation is applied used a UV lamp on exposed areas (crept out adhesive).

Office action of 10/19/05, page 3, line 19, to page 4, line 2.

Appellant's position is that Loctite does not teach irradiating from above the magnet, not that Loctite does not teach irradiating before heat curing. Consequently, this argument is irrelevant.

**C. CONCLUSION**

For the following reasons, the rejection of claims 1-3 and 8-10, all the claims pending in the application, under 35 U.S.C. § 103(a) as unpatentable over Sone in view of Loctite should be reversed:

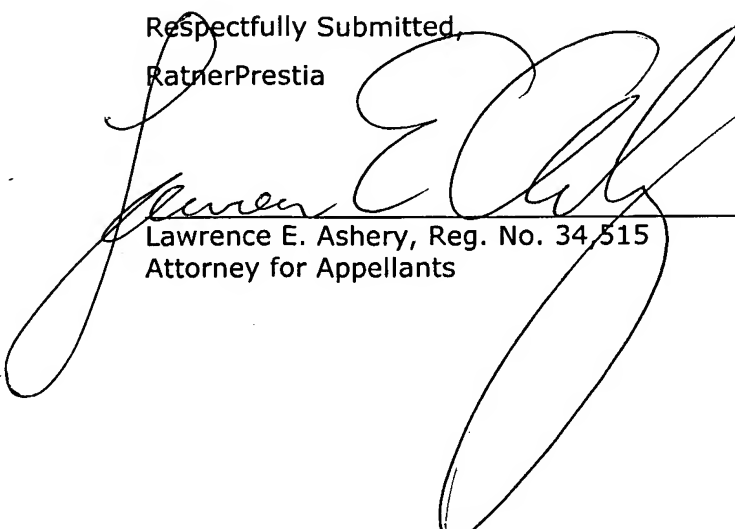
1. Loctite teaches away from the invention and cannot be combined with Sone.
2. The combination of Sone and Loctite at best makes heat + UV curing adhesives obvious to try.
3. The combination of Sone and Loctite does not produce appellant's invention.

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Reversal of the rejection of claims 1-3 and 8-10 as unpatentable over Sone in view of Loctite is earnestly solicited.

Respectfully Submitted,  
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Dated: July 25, 2006

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**APPENDIX OF CLAIMS**

1. (Previously Presented) A method of manufacturing an electro-acoustic transducer comprising the steps of:

providing a frame;

forming an adhesive layer on the frame, the adhesive layer being a heat-curing and UV-curing adhesive layer;

forming a frame-magnet laminate by disposing a magnet on the frame with the adhesive layer in between;

irradiating UV light to the laminate from above the magnet to cure a portion of the adhesive layer, the portion being a crept out portion of the adhesive layer;

heating, after the UV irradiation the frame-magnet laminate to cure a remaining portion of the adhesive layer; and

disposing a diaphragm above said magnet.

2. (Original) The method of claim 1, wherein a case is integrally molded with the frame, further comprising a step of bonding a resonance case to the case integrally molded with the frame.

3. (Original) The method of claim 2, wherein the resonance case is provided with a sound hole.

4.-7. (Cancelled).

8. (Previously Presented) A method of manufacturing an electro-acoustic transducer comprising the steps of:

providing a frame;

forming an adhesive layer on the frame, the adhesive layer being one of a heat-curing adhesive layer and a self-curing adhesive layer;

forming a frame-magnet laminate by disposing a magnet on the frame with the adhesive layer in between;

forming a UV-curing adhesive layer on the magnet and on a case of the frame-magnet laminate;

irradiating UV light to the laminate from above the magnet to cure a portion of the adhesive layer;

heating the frame-magnet laminate to cure a remaining portion of the adhesive layer; and

disposing a diaphragm above said magnet.

9. (Previously Presented) A method of manufacturing an electro-acoustic transducer of claim 8, wherein the case is integrally molded with the frame, further comprising a step of bonding a resonance case to the case integrally molded with the frame.

10. (Previously Presented) A method of manufacturing an electro-acoustic transducer of claim 9, wherein the resonance case is provided with a sound hole.

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**IX. EVIDENCE APPENDIX**

None.

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**X. RELATED PROCEEDINGS APPENDIX**

None